

All Regional Engineers

Michael L. Hine

Special Provision for Reflective Crack Control Treatment

April 21, 2006

This special provision was developed by the Bureau of Materials and Physical Research and the Illinois Highway Development Council to add another material option for reflective crack control treatment. It has been revised to correct a typo.

This special provision should be used on all contracts requiring reflective crack control treatment.

The districts should include the BDE Check Sheet marked with the applicable special provisions for the August 4, 2006 and subsequent lettings. The Project Development and Implementation Section will include a copy in the contract.

This special provision will be available on the transfer directory April 21, 2006.

80160m

REFLECTIVE CRACK CONTROL TREATMENT (BDE)

Effective: April 1, 2006

Revised: August 1, 2006

Revise the third sentence of the first paragraph of Article 443.01 of the Standard Specifications to read:

“Strip reflective crack control treatment shall be either System A, B, C, or D at the option of the Contractor.”

Add the following to Article 443.02 of the Standard Specifications:

“(g) Hot-Poured Joint Sealer..... 1050.02”

Revise Article 443.09 of the Standard Specifications to Article 443.10.

Revise Article 443.10 of the Standard Specifications to Article 443.11.

Add the following Article to the Standard Specifications:

“Article 443.09 Reflective Crack Control System D. The stress relief membrane shall be applied when the surface temperature is a minimum of 10 °C (50 °F) and rising.

(a) Tack Coat Placement for Membrane. The tack coat shall be applied to the existing surface using one of the following methods.

(1) A hand held wand with a nozzle that produces a fan shaped spray to apply the tack coat evenly according to the rate specified by the manufacturer.

(2) A hand held wand without a spray nozzle. The tack coat shall be spread with a squeegee according to the rate specified by the manufacturer.

(3) A distributor bar attached to a distributor truck, for longitudinal applications only. The distributor bar nozzles shall be set at 20 degrees to the axis of the bar and the tack coat shall be applied according to the rate specified by the manufacturer. Application of the tack coat directly from a distributor bar attached to a distributor truck will not be permitted for transverse applications.

The maximum width of the tack coat application shall be such that the tack coat extends a maximum 40 mm (1 1/2 in.) on both sides of the stress relief membrane strip.

The use of emulsified asphalts and/or cutbacks is prohibited for use as a tack to bond the stress relief membrane to the existing pavement surface.

(b) Stress Relief Membrane Placement. The open grid woven polyester side of the material shall be placed up with the nonwoven side placed into the tack. The stress relief

membrane shall be centered over the crack or joint on the existing surface and with a minimum of 150 mm (6 in.) of the membrane extending beyond the edges of the joint.

The material shall be laid smooth with no uplifted edges. The stress relief membrane shall be placed and rolled immediately with a riding static drum roller or a rubber tire roller. A maximum of three minutes shall pass between the first and second rolling efforts.

The stress relief membrane shall be butted where transverse and longitudinal joints meet or where two rolls must be joined. When required, the stress relief membrane shall be cut with a razor knife from the woven polyester side.

The stress relief membrane shall be placed at least two hours in advance of paving operations. If application must immediately precede the paving operation, hot-poured joint sealer may be required as a tack coat to bond the stress relief membrane to the existing surface.

- (c) Traffic Exposure. Exposing the membrane to traffic shall be minimized. Small amounts of washed sand may be used to blot excess asphalt cement tack coat when necessary to facilitate movement of traffic or construction equipment over the membrane prior to placement of the overlay. Damaged membranes shall be removed and replaced.
- (d) Paving Tack Coat/Paving. Paving operations shall only begin when the membrane is thoroughly bonded to the existing surface. The membrane may be exposed to moisture and rain prior to the application of the overlay, however, the stress relief membrane must be dry at the time the overlay is placed.

A slow-set emulsified asphalt paving tack coat (such as SS-1, SS-1h, CSS-1, or CSS-1h) shall be applied prior to paving over the membrane. Cutback asphalts shall not be used. Hot-mix asphalt or dry washed sand may be placed ahead of the paver if the membrane is sticking to the tires of the paving equipment. The minimum asphalt overlay thickness (total) shall be 50 mm (2 in.) compacted.

When using a vibratory roller for compaction, it shall be set to the lowest amplitude and highest frequency settings.”

Add the following Article to the Standard Specifications:

“1062.04 Reflective Crack Control System D. The stress relief membrane shall be 900 mm (36 in.) wide and 4 mm (0.15 in.) thick and shall be a system of materials manufactured in a composite three layer fashion with the following properties.

Stress Relief Membrane		
Property	Value	Test Method
Cold Flex	No cracking or separation of fabric	ASTM D 146 (modified)
Tensile Strength (Peak)	700 N/mm (4,000 psi) min.	ASTM D 412 (modified)
Elongation (at Peak Tensile)	10 % min.	ASTM D 412 (modified)
Weight	3.7 kg/sq m (0.76 lbs/sq ft)	
Density (mastic)	1100 kg/cu m (69 lbs/cu ft) min.	ASTM D 70
Thickness	4 mm (0.15 in.)	ASTM E 154-93 Subsection 10.0 ASTM D 1790
Absorption (mastic)	1 % max.	ASTM D 517
Brittleness	Passes	ASTM D 517
Softening Point (mastic)	104 °C (220 °F)	ASTM D 36

The bottom layer of the composite shall be a low strength, nonwoven, geotextile and shall be according to AASHTO M 288-92. The bottom geotextile shall be designed to fully bond with the existing pavement with the help of a tack coat. It shall be capable of accommodating sufficiently large stresses at the joint/crack without breaking its bond with the slab. The middle layer of the composite shall be a viscoelastic membrane designed to prevent water entry into the pavement through the cracks and/or joints in the pavement. It also acts as a stress absorbing member interlayer between the overlay and the underlying pavement. The top layer shall be a high strength woven geotextile with a tensile strength of 700 N/mm (4,000 psi) at five percent strain according to ASTM D 4595. The top geotextile shall be designed to fully bond with the overlay and provide high stiffness and reinforcement to the overlay.

The stress relief membrane shall be stored in an inside enclosure with temperatures not exceeding 49 °C (120 °F). Any material that becomes wet prior to installation shall be removed from the jobsite and discarded.

The grade of asphalt binder tack coat shall be PG 64-22, PG 58-28, or PG 52-28 and shall meet the requirements of Article 1009.05.

Emulsified asphalt for tack coat shall be SS-1, SS-1h, CSS-1, CSS-1h, CSS1hP, or SS-1hP and shall meet the requirements of Article 1009.07.

The manufacturer shall furnish a certification with each shipment of stress relief membrane, stating the amount of product furnished, and that the material complies with these requirements."

80160